US005082642A

United States Patent [19]

Bickar et al.

[11] Patent Number: 5,082,642

[45] Date of Patent: Jan. 21, 1992

[54] METHOD FOR CATALYZING OXIDATION/REDUCTION REACTIONS OF SIMPLE MOLECULES

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[21] Appl. No.: **607,634**

[22] Filed: **Oct. 31, 1990**

Related U.S. Application Data

[60] Continuation of Ser. No. 328,802, Mar. 23, 1989, abandoned, which is a continuation of Ser. No. 179,981, Apr. 11, 1988, abandoned, which is a division of Ser. No. 648,952, Sep. 10, 1984, Pat. No. 4,751,068.

[51] **Int. Cl.**[5] **C01B 21/22**

[52] **U.S. Cl.** **423/402**; 423/659

[58] **Field of Search** ..... 423/573 R, 573 C, 576, 423/730, 246, 247, 574 R, 574 C, 437, 402, 659; 502/163

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[57] **ABSTRACT**

This invention relates to a method for catalyzing the reactions

$$QZ+H_2X?QZX \quad (1)$$

and

$$QZX?QZ+H_2X \quad (2)$$

wherein

Q=C or N;

Z=O or S;

X=O, S, NH or NR;

R=C_1 to C_8 alkyl which may be linear, branched or cyclized,

which comprises:

contacting at least one polydentate nitrogen-containing chelating agent complexed with a metal atom with the reactants of one of said reactions, wherein said contacting takes place in the presence of a means for oxidizing when reaction (1) is catalyzed and in the presence of a means for reducing when reaction (2) is catalyzed. A particular reaction is the conversion of NO to NO_2 using water and supported porphines, hemes, phthalocyanines, ethioporphrins sirohemes, particularly heme and heme compounds or derivatives such as methemoglobin, myoglobin, or hemin.

18 Claims, 4 Drawing Sheets